The Role of Television in Adolescents' Sexual Attitudes: Exploring the Explanatory Value of the Three-Step Self-Objectification Process

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Abstract

A three-wave panel study of adolescent boys and girls *(N* = 1,041) tested an integrative model to explore whether the multidimensional process of self-objectification acts as an explanatory mechanism for the well-documented influence of sexual television messages on adolescents' acceptance of gendered sexual roles. A structural equation model showed that viewing sexualizing sitcoms (time 1) predicted the internalization of appearance ideals and valuing appearance over competence (time 2). In turn, the internalization of appearance ideals positively predicted body surveillance and valuing appearance over competence (all time 2). Valuing appearance over competence also predicted body surveillance (all time 2). Finally, the internalization of appearance ideals (time 2) positively predicted acceptance of gendered sexual roles (time 3). The discussion focuses on the implications of these findings to explain the relationships among sexualizing media, self-objectification and the developing sexuality and body image of adolescents.

Keywords: adolescence, television, objectification theory, sexuality, gendered sexual roles

The Role of Television in Adolescents' Sexual Attitudes: Exploring the Explanatory Value of the Three-Step Self-Objectification Process

Scholars have been increasingly concerned with the culture of sexualization in contemporary Western society (Moradi and Huang, 2008). The APA Task Force on the Sexualization of Girls (2007, p. 1) defines sexualization as evaluating individuals based on their sexual appeal or sexual behavior, equating standards of appearance with being sexually attractive, sexually objectifying a person and/or inappropriately imposing sexuality on individuals. This sexualization is expected to occur both in everyday personal interactions and in mass media (Fredrickson and Roberts, 1997). For instance, sitcoms have repeatedly been shown to emphasize the sexual appeal of characters and to value appearance ideals strongly (Fouts and Vaughan, 2002; Kim et al., 2007; Ward, 1995). Exposure to such television messages may need to be considered a sexualizing experience for media users (Fredrickson and Roberts, 1997; Vandenbosch and Eggermont, 2012, 2013).

Such sexualization is not without risks. The associated problems have been described by objectification theory (Fredrickson and Roberts, 1997) and research based on this theory (APA, 2007; Moradi and Huang, 2008). Sexualizing experiences, regardless of whether they occur through media, have been found to trigger an observer's perspective on one's own body, implying that individuals primarily value themselves because of their physical self or "body" instead of their personality (Fredrickson and Roberts, 1997). This *self-objectification* has been suggested to guide individuals toward sexual attitudes and behaviors that are compatible with their objectified self-concept (Gillen et al., 2006; Steer and Tiggemann, 2008). For instance, research has indicated that individuals with a stronger appearance orientation are more likely to adhere to traditional sexual gender roles (Gillen et al., 2006), because such stereotypes tend to illuminate how the *body* constitutes one's sexual role; these stereotypes tend to attribute sexual dominance to the male body and sexual submissiveness to

the female body. Endorsement of such gendered stereotypes on sexual roles has been seen to harm the developing ability of adolescents to engage in authentic, rewarding sexual interactions (Sanchez et al., 2012, p.17).

The current study tests a model that organizes research on the relationships among exposure to sexualizing television, the process of self-objectification and gender-stereotypical sexual attitudes. It expands prior research on this topic in three ways. First, the study used a three-wave panel design. Unlike television research on sexual behavior (e.g., Collins et al., 2004), the dominant design to examine relationships between television exposure and sexual attitudes is the cross-sectional survey (Ward, 2003). Likewise, cross-sectional surveys have primarily been used to explore associations between television exposure and the process of self-objectification (Vandenbosch and Eggermont, 2012). Although both lines of research focus on the effects of television, studies have rarely applied a longitudinal design to test assumptions regarding temporal order (Moradi and Huang, 2008; Ward, 2003). A second contribution relates to the study's sample of adolescents. The extensive developments in adolescents' body image (Markey, 2010) and sexuality (Ward, 2003) have been hypothesized to increase adolescent awareness of their appearance and sexuality and thus have led to a call for more research on how the sexuality and body image of particularly young people may be influenced by exposure to sexualizing television (APA, 2007). As a response to this call, the study focuses on young people between the ages of 12 and 18.

The most important contribution lies in the study's integration of the literature on media, sexuality and objectification in an explanatory model for the relationship between television viewing and sexual attitudes. The study aims to test a potential explanatory mechanisms for the relationship between television viewing and the endorsement of gender-stereotypical sexual attitudes; this relationship has been supported by empirical evidence (Ward, 2003) but has also been challenged with null findings (e.g., Ward and Friedman,

2006). The null findings have been attributed to the limited theoretical basis for explaining such sexual media effects (Collins et al., 2004; Ward et al., 2011). Sexual effects of television viewing have commonly been explained by wide-ranging media effect theories, such as cultivation theory and social cognitive theory (e.g., Zurbriggen and Morgan, 2006). These theories have initially been applied, or in some cases even developed, to explain the impact of television violence (Eggermont, 2006; Ward, 2003). However, when this theoretical framework is used to explain effects of exposure to sexual content, it may lack insights in young people's (sexual) identity. Therefore, just as research on television violence has benefitted from criminological knowledge (e.g., Custers and Van Den Bulck, 2013), sexual media research may need to turn to knowledge on (sexual) identity and body culture. From this perspective, the current study will explore whether objectification theory and, more specifically, the three-step process of internalization, valuing appearance over competence and body surveillance may offer insights into the effect of television viewing on sexual attitudes.

1.1. Television Effects on Gender-Stereotypical Sexual Attitudes

Television content that is popular among adolescents has repeatedly been criticized for its high prevalence of sexual references. Eyal et al. (2007, p. 328) found sexual messages in 94% of adolescents' preferred sitcoms. These messages are likely to be sexualizing (APA, 2007; Kim et al., 2007). Sexually oriented television content has consistently been shown to disseminate a narrowly defined appearance standard of young, white and slim (women) or muscular (men) (Aubrey and Frisby, 2011; Ward, 1995), and to associate this attractiveness with disregard for the personalities of both women and men. In addition, studies have identified the marked gender-stereotypical nature of the sexual roles ascribed to women and men on television (Kim et al., 2007). Traditional gendered sexual roles posit that men have sexual independence and are unable to say "no" to sex, whereas women are primarily judged

on their ability to maintain a successful relationship, their sexual attractiveness and the protection of their sexual reputation (Fromme and Emihovich, 1998; Reiss, 1956; Ward, 1995). In line with literature's conceptualization of traditional gendered sexual roles, analyses of television content have distinguished between a more sexually permissive, active norm for boys, which is also reflected in the focus on their strength and muscularity, and a more passive, sexually protective, appearance-focused norm for girls, which transpires in the focus on their fragility and thinness (e.g., Kim et al., 2007). Moreover, television content often appears to establish a link between characters' compliance with those norms and their acquiring of social advantages, such as being popular or sexually involved with an attractive other (Aubrey and Frisby, 2011; Vandenbosch et al., 2012). The notion that conduct in accordance with gendered sexual roles is the main instrument to gain social benefits has been found in various analyses of television content (e.g., Kim et al., 2007; Ward, 1995).

Social cognitive theory (Bandura, 2001) predicts that exposure to gendered sexual roles and to the association between these roles and social "rewards" may teach boys and girls about the importance of adherence to traditional sexual gender roles (Ward, 2003). However, despite the high prevalence of gendered sexual roles in mass media (e.g., Kim et al., 2007; Ward, 2003), conflicting results have been reported on the relationship between exposure to this content and endorsement of gender-stereotypical sexual attitudes. Although cross-sectional research has found stronger acceptance among young viewers of reality dating programs that men are sex driven and that women are sex objects (Ferris et al., 2007; Zhang et al., 2008), Ward and Friedman (2006) showed that adolescents' viewing of music videos and prime-time programs did not predict acceptance of such notions. In addition, Zurbriggen and Morgan (2006) suggested that overall television viewing and watching reality dating programs did not affect acceptance of gendered sexual roles.

Those inconsistencies necessitate a thorough understanding of the processes that could explain the (possible) relationship between television use and increased endorsement of gendered sexual roles. In this study, we specifically test the hypothesis that the three-step process of self-objectification functions as an underlying mechanism for this relationship (Fredrickson and Roberts, 1997; Moradi and Huang, 2008). This hypothesis implies that, first, sufficient empirical evidence exists for a three-step process of self-objectification; second, that this process partly results from television exposure; and third, that this process in turn affects endorsement of gendered sexual roles.

1.2. The Three-Step Process of Self-Objectification

Moradi and Huang (2008) and Roberts (2012) recently proposed to integrate insights on valuing appearance over competence, body surveillance, and the internalization of appearance ideals into one multidimensional model. Vandenbosch and Eggermont (2012, 2013) were the first to test the theoretically proposed order of this three-step process of self-objectification; consistent with theoretical assumptions (Calogero et al., 2011; Moradi and Huang, 2008; Roberts, 2012), their results suggested that the process of developing self-objectification begins, first, with the internalization of appearance ideals, which is the extent to which individuals consider the promoted appearance ideals as one's own ideals to pursue (Thompson et al., 2003). In a second step, this internalization has been shown to increase valuing appearance over competence, which encompasses the extent to which individuals consider appearance-oriented body attributes, such as sexual appeal, as more important than competence-oriented body attributes, such as physical fitness (Noll and Fredrickson, 1998; Vandenbosch and Eggermont 2012, 2013). When individuals evaluate their body (i.e., valuing appearance over competence), they are expected to apply the knowledge they have acquired about appearance ideals (i.e., internalization). In a third step, both internalization and valuing appearance over competence, which are cognitive components of the process, have in turn

been seen to influence the behavioral component of the process, body surveillance, which is described as the habitual monitoring of one's appearance (McKinley and Hyde, 1996; Vandenbosch and Eggermont 2012, 2013). Recent theoretical and empirical evidence thus supports to consider self-objectification as a three-dimensional process, in which internalization stimulates valuing appearance over competence and both internalization and valuing appearance over competence increase body surveillance (Moradi and Huang, 2008;Vandenbosch and Eggermont, 2012, 2013).

1.3. Television Effects on the Three-Step Process of Self-Objectification

Research has revealed that each component of the process of self-objectification may be triggered by exposure to television. For instance, studies have repeatedly shown that adolescents appear to learn about prevailing standards of attractiveness from the media. Tiggemann (2005) specifically found that watching television was associated with the internalization of appearance ideals. Studies have also shown that viewing sexually objectifying television content increases valuing appearance over competence (Aubrey, 2006) and that this relationships is mediated by internalization (Morry and Statska, 2001).

In addition, two cross-sectional studies have recently examined how the three-step self-objectification process is related to different types of sexualizing media among adolescent girls (Vandenbosch and Eggermont, 2012) and boys (Vandenbosch and Eggermont, 2013). The study among girls focused on the relationships between music television, primetime television programs, fashion magazines, and social networking sites and the internalization of appearance ideals, valuing appearance over competence, and body surveillance. Exposure to several types of sexualizing media (e.g., fashion magazines) was found to be directly related to the internalization of appearance ideals and valuing appearance over competence. The relationships between exposure to sexualizing media and valuing appearance over competence, and between exposure to sexualizing media and body surveillance were also

(partially) mediated by the internalization of appearance ideal. The study further showed that exposure to sexualizing media may indirectly affect body surveillance through valuing appearance over competence. Specifically with regard to primetime television, the study reported that exposure to this medium was not related to the three-step process when the other media were also included in the predictive model. However, when only exposure to sexualizing primetime television was used to predict the multidimensional process, it did emerge as a significant predictor. The study among boys (Vandenbosch & Eggermont, 2013) found similar direct and indirect relationships between exposure to different types of sexualizing media and the three-step process of self-objectification. Moreover, primetime television was found to significantly predict the process of valuing appearance over competence through internalization, even when the other media were also included in the predictive model.

In sum, these two studies together with earlier research (e.g., Aubrey, 2006) support the relevance of studying television's impact on the three-step process of self-objectification. This suggested impact of television exposure on the three-step process of self-objectification has however never been examined on a longitudinal basis (e.g., Vandenbosch and Eggermont, 2012, 2013). Addressing this gap is an additional objective of this study.

1.3. The Three-Step Self-Objectification Process and Gender-Stereotypical Sexual Attitudes

While television research has focused on the impact of television on both sexuality (e.g., Ferris et al., 2007) and body image (e.g., Aubrey, 2006), it has rarely considered to examine potential links between the effects of television on body image and sexuality. According to objectification theory, it is, however, important to integrate separate lines of research on sexuality and body image (Fredrickson and Roberts, 1997; Gillen et al., 2006). A process of self-objectification is likely to affect not only body-related outcomes but also other

physical domains, such as the sexual domain (Fredrickson and Roberts, 1997; Steer and Tiggemann, 2008; Woertman and Van den Brink, 2010). Gillen et al. (2006, p. 234) stated that "[b]ody image and sexuality, both physically oriented domains of the self, are likely linked, but few studies have examined their associations." Fredrickson and Roberts (1997) remarked that "the body" has largely been disregarded in discussions on sexuality. This is one of the reasons why these authors developed objectification theory (1997) as a conceptual framework that a variety of disciplines can apply to address the role of the body in shaping social meaning and why the process of self-objectification has been hypothesized to provide key insights in sexuality-related problems. More specifically, it can be derived from objectification research that individuals who develop an objectified self-concept may shape their sexual world in line with how they perceive themselves; they may prefer to manifest and present themselves, but also relevant others, as sexual objects (Fredrickson and Roberts, 1997). Sexual attitudes, such as recreational sexual attitudes and, of particular relevance for this study, attitude toward gendered sexual roles, have been demonstrated to reflect an objectified, instrumental interpretation of sexuality (Ward, 2003) and may thus be affected by self-objectification.

The suggestion of a relationship between an objectified self-concept and acceptance of gendered sexual roles is corroborated with research relating to parts of the three-step process of self-objectification (e.g., Gillen et al., 2006; Cash et al., 1997). Cash et al.'s (1997) study, for instance, suggested that the internalization of appearance ideals guides college women's ideas of how muscular men and thin women should act in sexual relationships and causes them to accept gender-stereotypical sexual attitudes. The cross-sectional study of Gillen et al. (2006) reported a relationship between the level of importance that is attached to one's own appearance and increased acceptance of gendered sexual roles among adolescents. This finding refers to the valuing of one's outward appearance more highly than one's physical

competences (Noll and Fredrickson, 1998), and suggests that valuing appearance over competence may affect an individual's perspective on the sexual roles of men and women. The relationship between the third component of the three-step process, body surveillance, and the endorsement of gender-stereotypical sexual attitudes has not yet been directly explored, but the theoretical framework on body surveillance predicts such a relationship (e.g., Woertman and Van den Brink, 2012): an individual's preoccupancy with his/her appearance is likely to increase the importance that he/she attaches to gender roles that are consistent with the societal ideals of appearance.

1.4. Hypothesized Model

The literature thus suggests that exposure to sexualizing television may increase both the three-step process of self-objectification and the acceptance of gendered sexual roles (e.g., Vandenbosch and Eggermont, 2012; Zhang et al., 2008). Furthermore, research has suggested that acceptance of gendered sexual roles can be explained by components of the self-objectification process (Calogero and Thompson, 2009; Cas et al., 1997; Fredrickson and Roberts, 1997; Gillen et al., 2006). Therefore, we propose that the three-step process of internalization, valuing appearance over competence and body surveillance could serve as an explanatory mechanism for the relationship between exposure to sexualizing television and the sexual attitudes of adolescents. Figure 1 illustrates our hypotheses:

[Figure 1 about here]

This study will investigate this model by examining one particular genre of television content: situation comedies. Sitcoms constitute the most popular primetime television content among adolescents (Kim et al., 2007; Ward, 1995). Moreover, studies examining popular primetime television content have repeatedly found that sitcoms contain more sexual messages than other primetime program genres, such as reality television (e.g., Farrar et al., 2003; Eyal et al., 2007; Ward, 1995). Sitcoms as compared to other popular primetime genres

have also been demonstrated to be more sexualizing (e.g., Kim et al., 2007). Kim et al. (2007) showed that sitcoms treat women more often as sexual objects and value men more strongly for their (muscular) strength. Because of this strong emphasis on sexualization, the current study chose to focus on sitcoms.

Furthermore, the study will control for BMI, age and country of origin, as research suggests that these factors may affect the hypothesized process. More specifically, research has shown that a higher BMI (Gillen et al., 2006), to have originated from a non-Western country (Ward, 2002) and being older (Ward, 2002) are associated with different sexual outcomes as well as with different levels on the three-step process of self-objectification (Aubrey, 2006; Harrison and Fredrickson, 2003; Knauss et al., 2008; Moradi and Huang, 2008).

Finally, research within the fields of sexual media effects and body image requires careful attention to possible gender differences. Research has found an influence of television viewing on acceptance of gendered sexual roles in both women and men (Ward, 2003). Regarding the process of self-objectification, earlier studies exclusively documented on the impact of television viewing on this process in girls (e.g., Grabe & Hyde, 2009), though, recent studies (e.g., Vandenbosch & Eggermont, 2013) have shown that the three-step process of self-objectification is also related to television viewing in boys. Even though research has reported an influence of television viewing on body image and sexuality in both boys and girls, scholars have also highlighted that television affects self-objectification (Moradi and Huang, 2008) and the acceptance of gendered sexual roles to a greater extent among girls (Ward, 2003). The directions of these relationships are thus expected to be similar, although the magnitude may differ according to gender.

2. Method

2.1. Sample and Participant Selection

A three-wave panel study with an interval of six months was conducted among 12- to 18-year-olds. Because of the relatively rapid sequence of developmental changes that occur during puberty (Mul, 2004), a six-month interval was chosen above a one-year interval. Moreover, the validity of such a six-month time interval has also been supported by prior sexual media research testing longitudinal models of processes that may mediate the relationship between media use and adolescents' sexuality (e.g., Peter & Valkenburg, 2008).

Approval for the survey and its procedures was granted by the institutional review board of the host university. In March 2010, a quantitative survey was conducted in 12 schools that were selected from those who agreed to participate from different parts of Flanders (the Dutch-speaking part of Belgium). Different schooling levels and ages were selected. All students who were present at the 12 schools during the researchers' school visits completed paper surveys. The students were informed that the goal of the study was to investigate their leisure habits. To increase confidentiality, the researchers ensured that no one was able to discuss or view the answers of the respondents. Additionally, anonymity was ensured by asking the students to write their identification data on separate forms and by guaranteeing that their survey answers would be processed separately from their identification data. In September 2010, a second quantitative survey was conducted in the 12 schools that had participated in March. Finally, in March 2011, a third quantitative survey was organized in the 12 schools. Based on the identification forms from waves 1, 2 and 3, the respondents were tracked over time.

A total of 1,504 students completed the questionnaire at baseline, 1,426 students participated in wave 2 and 1,433 students participated in wave 3. A total of 1,041 students (589 boys and 452 girls) completed the questionnaires for all waves (69%). Their mean age was 15.33 years (SD = 1.47). The majority of the sample (95%) was born in Belgium; 62.8%

followed a general educational program, which is representative of the overall school population (62.6%; Department of Education, 2011).

Differences were explored between the adolescents who participated in one wave (N = 463) and those who participated in all waves (N = 1,041) with regard to all relevant variables (all time 1). A χ^2-test revealed that the subjects who participated in one wave (69.5%) were more likely to be boys than those who completed all of the questionnaires (56.6%), $\chi^2(1) = 22.56$, $p < .001$. Other differences were revealed by a MANOVA analysis using Pillai's Trace, $V = .03$, $F(7, 1116) = 4.51$, $p < .001$, $\eta p^2 = .03$. Separate univariate ANOVAs on the outcome variables showed that the adolescents who participated in all waves scored lower on the acceptance of gendered sexual roles (M = 3.08, SD = .52 vs. M = 3.01 SD = .46), $F(1, 1122) = 7.85$, $p < .01$, $\eta p^2 = .01$, higher on the internalization of appearance ideals (M = 2.33, SD = .84 vs. M = 2.52, SD = .87), $F(1, 1122) = 7.49$, $p < .005$, $\eta p^2 = .01$, and higher on body surveillance (M = 2.91, SD = .88 vs. M = 3.11, SD = .85), $F(1, 1122) = 12.26$, $p < .001$, $\eta p^2 = .01$.

2.2. Assessments and Measures

2.2.1. Control variables. Participants reported their height and weight, which were used to calculate BMI (kg/m^2), and their country of origin (0 = *Belgium*, 1 = *other country*) and age.

2.2.2. Exposure to sexualizing sitcoms. Using a 5-point scale (*(almost) never* (= 1) through *(almost) every week* (= 5)), the participants indicated how often they watched each of 15 sitcoms broadcast during the three weeks prior to data collection. To select the sitcoms that were perceived as more sexualizing, college students (9 males and 20 females) were trained to address the level of sexualization in media content, which was described as a visual and thematic focus on the body and appearance in a sexualized manner (APA, 2007; Aubrey, 2006). After the training, the students answered three questions on a 5-point scale for each

sitcom that was included in the adolescent survey (Zurbriggen et al., 2011). The questions focused on the frequency and intensity of sexualization and the familiarity of the college students with the sitcoms (for further description, see Zurbriggen et al., 2011). These calculations indicated that the scores of three sitcoms were considerably higher than the scores of the other programs: "The Big Bang Theory", "Ugly Betty" and the local program "Wag's." The frequency of sexualization scores for these programs were $M = 3.52$, $SD = .87$ (Wags), $M = 3.05$, $SD = 1.00$ (The Big Bang Theory), and $M = 2.92$, $SD = .95$ (Ugly Betty). The intensity of sexualization scores for these programs were $M = 3.45$, $SD = .83$ (Wags), $M = 2.85$, $SD = 1.14$ (The Big Bang Theory), and $M = 3.08$, $SD = .95$ (Ugly Betty). The familiarity scores for these programs were $M = 1.55$, $SD = .74$ (Wags), $M = 2.75$, $SD = 1.67$ (The Big Bang Theory), and $M = 1.32$, $SD = .61$ (Ugly Betty).

These results on sexualization correspond to prior research that has also suggested that The Big Bang Theory and Ugly Betty promote sexualization (Esh, 2010; Willis, 2012). For instance, the study of Esh (2010) demonstrates that the sitcom "Ugly Betty" emphasizes that the main character "Betty" has inner beauty which is worthy, though, it does not compensate for the character's lack of compliance with the traditional appearance ideals. This study thus suggests that the program rather emphasizes narrowly defined beauty standards of sexual attractiveness and thus sexualizes its characters (APA, 2007).

The ratings of the pilot study were used to weigh the adolescents' frequency ratings of their sitcom viewing. To estimate the degree to which the respondents were exposed to sexualizing sitcoms, we calculated their mean scores for the three selected sitcoms.

2.2.3. Valuing appearance over competence. Valuing appearance over competence was measured with an adapted version of Noll and Fredrickson's Self-Objectification Questionnaire (1998). The respondents evaluated the importance of 12 body attributes on a 10-point scale (*not at all important* (= 1) – *very important* (= 10)). Similar to Vandenbosch

and Eggermont (2012), principal component analyses using direct oblimin separately for boys and girls extracted one appearance-based factor and one competence-based factor. For girls, the appearance-based attributes were physical attractiveness (factor loading = .81), coloring (.56), weight (.73), sex appeal (.78) and measurements (.66) (eigenvalue 1.88; explained variance 15.68%; α =.76), and the competence-based attributes were physical coordination (.57), stamina (.80), health (.56), physical fitness (.81), physical energy level (.78), muscular strength (.57) and muscle tone (.49) (eigenvalue 4.10; explained variance 34.20%; α = .80). For boys, the appearance-based factor (eigenvalue: 5.00; explained variance: 41.67%; α = .84) included physical attractiveness (.85), coloring (.73), weight (.63), sex appeal (.83), measurements (.60), muscular strength (.66) and muscle tone (.68), and the competence-based factor (eigenvalue: 1.64; explained variance: 13.67%; α = .83) included stamina (.83), health (.74), physical fitness (.83) and physical energy level (.78). Physical coordination was removed due to a factor loading lower than .40. The difference between the mean scores of the newly created appearance-based and competence-based factor addressed the level of valuing appearance over competence (from -9 to 9). Higher scores indicate higher levels of valuing appearance over competence.

2.2.4. Body surveillance. The questionnaire included the body surveillance subscale from the Objectified Body Consciousness Scale for Adolescents (Lindberg et al., 2006), of which prior research has demonstrated its validity and reliability (e.g., Grabe and Hyde, 2009; Lindberg et al., 2006). On a 5-point scale (*(almost) never* (=1) through *(almost) always* (=5)), the respondents evaluated four statements (α = .80) (e.g., "I often compare how I look with how other people look," "During the day, I think about how I look many times").

2.2.5. The internalization of appearance ideals. In the Internalization subscale of the Sociocultural Attitudes toward Appearance scale (Thompson et al., 2003), the respondents used a 5-point scale ranging from *I totally disagree* (= 1) to *I totally agree* (= 5) to evaluate

nine items, such as "I wish I looked like the models in music videos" and "I try to look like the people on TV." The subscale has a demonstrated validity and test–retest reliability among female college students (Thompson et al., 2003), but research among adolescents has suggested that the scale must be adapted to be reliable for younger respondents (Knauss et al., 2008). Consistent with Vandenbosch and Eggermont (2012), the reliability tests in this study indicated that two items reduced alpha. Subsequently, these items were omitted and a reliable seven-item scale remained (α = .92).

2.2.6. Acceptance of gendered sexual roles. To measure the acceptance of gendered sexual roles, we composed a scale based on Snell's Stereotypes about Male Sexuality Scale (1998), the Hyperfemininity Scale of Murnen and Byrne (1991) and the Attitudes towards Dating and Relationships of Ward and Rivadeneyra (1999) (α = .79). The respondents evaluated 15 statements on a 5-point scale ranging from *I totally disagree* (= 1) to *I totally agree* (= 5). Examples of items were "A boy should decide what happens during sexual activities," "It is important that girls do what boys ask during sexual activities," "If a girl wishes to attract her boyfriend, she is advised to use her appearance or her body" and "Having an attractive girlfriend enhances a boy's reputation."

3. Results

3.1. Descriptive Statistics and Preliminary Analyses

Descriptives for all relevant variables for the entire sample and separately for boys and girls are presented in Table 1. Using Pillai's Trace, a MANOVA analysis revealed significant differences between boys and girls with respect to all relevant variables of wave 1, V = .36, $F(5, 882) = 99.28$, $p <$ .001, ηp^2 = .36. Separate univariate ANOVAs on the outcome variables showed that girls scored higher on viewing sexualizing sitcoms, $F(1, 886) = 4.24$, $p < .05$, ηp^2 = .01, the internalization of appearance ideals, $F(1, 886) = 72.92$, $p < .001$, ηp^2 = .08, valuing appearance over competence, $F(1, 886) = 254.10$, $p < .001$, ηp^2 = .22, and body surveillance,

$F(1, 886) = 194.01$, $p < .001$, $\eta p^2 = .18$. Boys scored higher on the acceptance of gendered sexual roles, $F(1, 886) = 75.44$, $p < .001$, $\eta p^2 = .08$. (all time 1).

[Table 1 about here]

Zero-order correlations are presented in Table 2 for the entire sample and separately for boys and girls. They revealed longitudinal correlations between exposure to sexualizing sitcoms (time 1) and the internalization of appearance ideals (time 2), valuing appearance over competence (time 2) and body surveillance (time 2). However, consistent with prior null findings (e.g., Ward and Friedman, 2006), no associations were found between sexualizing sitcoms and acceptance of gendered sexual roles. Consistent with the multidimensional perspective on self-objectification, all components of the process were significantly related to one another. The internalization of appearance ideals (time 1, time 2) was also found to relate to the endorsement of gendered sexual roles (time 1, time 2, time 3). Examining the correlation coefficients separately for boys and girls, we observe that although the correlation coefficients for girls were larger than those for boys, the directions of the correlations were generally similar and consistent with prior objectification research (Moradi and Huang, 2008).

[Table 2 about here]

3.2. Testing the Hypothesized Model

Structural equation modeling (AMOS) using the maximum likelihood method was applied to test the hypothesized relationships (Figure 1). Cases with partially missing data were included in the analytical sample. The chi-square-to-degrees-of-freedom ratio (χ^2/df), the root mean square error of approximation (RMSEA) and the adjusted goodness-of-fit index (AGFI) were used to evaluate the fit of the model (Byrne, 2010). Consistent with prior research (Baumgartner et al., 2011), our model controlled for the baseline values of the country of origin, age and BMI by employing them as predictors for all endogenous variables and by allowing covariance with all variables of wave 1. In addition, the prior values were

also entered as control variables; for instance, internalization at wave 1 predicted internalization at wave 2. Similar to prior research on sexual media (Peter and Valkenburg, 2008), item parcels served as indicators for the Likert scales that included more than three items. Item parcels enable the predicting of stable parameters (Bandalos, 2002) and less likely violate the assumptions of multivariate normality underlying the maximum likelihood estimation procedure (Russell et al., 1998, p. 22). Item parcels were constructed based on the rank order results of the factor loadings of each item (Russell et al., 1998). More specifically, body surveillance was predicted by 2 item parcels, the internalization of appearance ideals by 3 item parcels and acceptance of gendered sexual roles by 7 item parcels.

Several preliminary analyses ensured that the model with the most superior fit was reported. Because the measurement of valuing appearance over competence differed between boys and girls, we applied the following procedure. First, we estimated a model that allowed (structural and measurement) residuals to vary freely between boys and girls because Byrne (2010) advised that constraining residuals to be equal across groups is typically too stringent, especially when different measures may be responsible for significant differences in residuals. We refer to this model as the constrained model. Second, we compared the fit of the constrained model with the fit of a model that allowed the hypothesized relationships to vary between boys and girls. Model comparison tests showed that the hypothesized relationships did not significantly differ between boys and girls ($p > .05$). Moreover, when we compared the AIC of the constrained model (3811,435) with the AIC of the unconstrained model (3823,095), the fit of the constrained model appeared to be superior (Byrne, 2010). Therefore, we chose to report the constrained model. The unstandardized regression coefficients and standard errors were similar for boys and girls, but small differences were found between the standardized regression coefficients because of the allowance of varying error terms.

The final (constrained) model is presented in Figure 2. For clarity, the measurement part and the paths from the control variables have been omitted. This model demonstrated an adequate fit, $\chi^2 = 3369.44$, df = 1339, $p < .001$, RMSEA = .04, AGFI = .85, $\chi^2/df = 2.52$. The model showed that viewing sexualizing sitcoms at wave 1 did not predict the acceptance of gendered sexual roles at wave 3, $p > .05$. However, viewing sexualizing sitcoms at wave 1 significantly predicted the internalization of appearance ideals at wave 2, $\beta_{girls} = .15$, $\beta_{boys} = .15$, $B = .55$, $SE = .19$, $p < .005$, and valuing appearance over competence at wave 2, $\beta_{girls} = .15$, $\beta_{boys} = .14$, $B = .89$, $SE = .30$, $p < .005$. In turn, the internalization of appearance ideals at wave 2, $\beta_{girls} = .27$, $\beta_{boys} = .25$, $B = .23$, $SE = .03$, $p < .001$, and valuing appearance over competence at wave 2, $\beta_{girls} = .07$, $\beta_{boys} = .06$, $B = .03$, $SE = .01$, $p < .05$, predicted body surveillance at wave 2. The internalization of appearance ideals at wave 2 also predicted valuing appearance over competence at wave 2, $\beta_{girls} = .09$, $\beta_{boys} = .08$, $B = .24$, $SE = .05$, $p < .005$. Furthermore, the internalization of appearance ideals at wave 2 significantly predicted the acceptance of gendered sexual roles, $\beta_{girls} = .08$, $\beta_{boys} = .06$, $B = .03$, $SE = .01$, $p < .05$. Contrary to our expectations, no other significant relationships were found.

Furthermore, we calculated indirect effects by multiplying the indirect standardized path coefficients (Cohen and Cohen, 1983). Because they are similar for boys and girls when rounded at 2 decimals, we report the indirect effects only once. To test whether the indirect effects were different from zero, we applied Sobel's formula. Mediation tests revealed that when adolescents viewed sexualizing sitcoms more frequently, their internalization of appearance ideals increased, which in turn was related to higher levels of valuing appearance over competence (.01; $z = 2.18$, $p < .05$) and body surveillance (.04; $z = 2.83$, $p < .005$). The mediation effect of watching sexualized sitcoms on agreement with gendered sexual roles through the internalization of appearance ideals was only marginally significant (.01; $z = 1.66$, $p = .09$). The same is true for valuing appearance over competence as a mediator: higher

levels of internalization of appearance ideals increased valuing appearance over competence, which was in turn associated with higher levels of body surveillance (.01, $z = 1.8$, $p = .06$).

[Figure 2 about here]

4. Discussion

The current study tested whether the three-step process of self-objectification acted as an explanatory mechanism for the influence of sexualizing messages on endorsement of gendered sexual roles. Three important conclusions can be derived. First, exposure to sexualizing sitcoms predicted the three-step process of self-objectification over time; the results provide support for the television effect perspective that has been adopted in cross-sectional studies (e.g., Grabe and Hyde, 2009) and the relevance of the three-step perspective on self-objectification in media research (Vandenbosch and Eggermont, 2012). Second, within the three-step process, the internalization of appearance ideals was found to play a key role in adolescents' development of valuing appearance over competence and body surveillance and in their acceptance of traditional gendered sexual roles. These findings underscore the importance of internalization within the objectification framework, and suggest it may also be important for explaining the development of sexual gender stereotypes (Kim et al., 2007; Sanchez et al., 2012). Third, the results on the process of self-objectification as an explanation for sexual television effects highlight a need for additional research to elaborate on the value of this mechanism.

4.1. Influence of television viewing on the process of self-objectification

Viewing sexualizing sitcoms predicted the internalization of appearance ideals and valuing appearance over competence. In turn, the internalization of appearance ideals positively predicted body surveillance and valuing appearance over competence. Valuing appearance over competence also predicted body surveillance. Thus, the results of this study provide the first longitudinal evidence that sexualizing television can influence the developing

body image of adolescents by encouraging them to internalize narrowly defined appearance ideals and to treat their own bodies as objects. Both internalization and valuing appearance over competence were in turn found to increase the preoccupancy of adolescents with monitoring their outward appearance during everyday life.

These results extend prior cross-sectional research of the relationship between media use and the three-step process of self-objectification. The current study supports previously reported cross-sectional relationships between television viewing and internalization (e.g., Morry and Statska, 2001; Tiggemann, 2005), valuing appearance over competence (Aubrey, 2006), and body surveillance (Vandenbosch and Eggermont, 2013), but to some extent contrasts with the findings of Vandenbosch and Eggermont (2012). Unlike this study, Vandenbosch and Eggermont (2012) did not find that primetime television predicted the process of self-objectification; they speculated that exposure to sexualizing primetime television may be a less intense experience of sexualization compared to exposure to other media types, such as fashion magazines. However, the current study did not focus on exposure to overall television content but on a television genre that has been found to be one of the most pervasive sexualizing genres: sitcoms (e.g., Kim et al., 2007), which may explain why the current study did show that sexualizing television may trigger the self-objectification process. Moreover, the current study also responded to Vandenbosch and Eggermont' s (2012) call to apply a more robust longitudinal design and thus further informs us on the suggested temporal order of the relationships between sexualizing media and the self-objectification process.

Although the reported effect sizes are relatively small, scholars have warned of the harmful role that even small increases in internalization, valuing appearance over competence and body surveillance may play in the development of (mental) health risks, such as depression, eating disorders and sexuality-related problems (Fredrickson and Roberts, 1997;

Moradi and Huang, 2008). Adolescence is a critical period for identity formation in which they not only develop a new physical identity driven by their sexual maturation but also a sexual identity that is encouraged by various sexual socialization agents and sexual maturation (Markey, 2010; Ward, 2003). The combination of hormonal, physical and social changes with an unstable, developing identity may increase the impact of self-objectification for this particular developmental group (Fredrickson and Roberts, 1997). The need to identify factors that may protect adolescents from self-objectification and to develop programs that stimulate such protective factors warrants attention. Such research should be conducted among both girls and boys, as the influence of sexualizing television was found for both genders. This finding fits in with the increasing body of literature showing that a substantial number of young men are preoccupied with their appearance and that Western society generally appears to highly value male appearance standards (e.g., Aubrey, 2006; Vandenbosch and Eggermont, 2013).

4.2. Influence of the three-step process of self-objectification on the acceptance of gendered sexual roles.

The internalization of appearance ideals predicted acceptance of gendered sexual roles, which suggests that appearance ideals play a role in shaping perceptions about the male and female sexual role. However, neither the cognitive component of valuing appearance over competence nor the behavioral component of body surveillance were related to the acceptance of gendered sexual roles over time. These findings contrast with the importance that objectification scholars attribute to valuing appearance over competence and body surveillance for explaining sexual attitudes that are consistent with how adolescents perceive themselves (e.g., Fredrickson and Roberts, 1997). Moreover, these results suggest that internalization may not only play a central role for explaining why sexualizing media use supports adolescents to apply an observer's perspective towards their own body (= valuing

appearance over competence) and to regularly monitor their own appearance (= body surveillance) (Vandenbosch & Eggermont, 2012), but also for illuminating how television may affect adolescents' sexual attitudes.

The finding that only the internalization component of the three-step process related to acceptance of gendered sexual roles may be explained by considering the extent to which internalization, valuing appearance over competence and body surveillance are self-oriented or other-oriented (Lindberg et al., 2006; Noll and Fredrickson, 1998; Thompson et al., 2003). Valuing appearance over competence and body surveillance emphasize a perspective that is oriented toward an individual's own body (Lindberg et al., 2006), whereas internalization, which refers to learning about societal standards of appearance and thus about other individuals' bodies, is initially focused on others (Thompson et al., 2003). The lack of focus on the appearances of other individuals in both the concepts of valuing appearance over competence and body surveillance may explain why these components did not affect adherence to generalized gender-stereotypical roles. The concepts of valuing appearance over competence and body surveillance may be especially relevant in explaining the attitudes and behaviors of individuals concerning their own body and sexuality (e.g., Calogero and Thompson, 2009) but may be less important for the development of social meanings surrounding the sexuality of other individuals, such as the socially preferred roles of men and women. This explanation implies that an effect of valuing appearance over competence and body surveillance can perhaps be found in adolescents' attitudes regarding their own role in relationships: girls scoring high on valuing appearance over competence and body surveillance may prefer to act more sexually submissive in a heterosexual relationship, whereas boys scoring high on valuing appearance over competence and body surveillance may have a greater tendency to adhere to the role of being sexually dominant. Future research is needed to explore this explanation.

Finally, the results suggest that a cognitive component of the self-objectification process (i.e., internalization) is the only component that significantly shapes sexual cognitions about the roles of men and women. This finding is in line with the theory of cognitive dissonance (Festinger 1957), which assumes that individuals strive toward consistency or consonance in one's own cognitions. According to the theory of cognitive dissonance, adolescents who have learned about appearance ideals from sitcoms are motivated to develop cognitions that support these previously adopted appearance focused cognitions, such as cognitions on the sexual dominance of muscular men and the sexual submissiveness of thin women. Future research may further explore how the acceptance of gendered sexual roles may subsequently affect other cognitively consonant cognitions, such as beliefs about heterosexual normativity.

4.3.The three-step process of self-objectification for explaining sexual television effects

The current study was one of the first attempts to organize multidisciplinary knowledge that is derived from research on objectification, traditional sexual stereotypes and television effects into a comprehensive framework for explaining sexual television effects. This leads to two conclusions. First, the direct relationship between the use of sitcoms and the acceptance of gendered sexual roles appeared to be non-significant, which is consistent with null-findings in some of the previous media studies on the acceptance of gendered sexual roles (e.g., Ward and Friedman, 2006; Zurbriggen and Morgan, 2006). However, the findings of this study implicitly provide an explanation for the absence of this direct relationship. The central role of the internalization of beauty ideals in the model suggests that this internalization may be a prerequisite for the effect of media exposure on acceptance of gendered sexual roles. Merely exposure to certain contents may not suffice for the occurrence of an effect (hence the null findings); it is only when adolescents process the messages in a

certain way (for instance, internalize the portrayed norms) that they may have an impact on their sexual attitudes. This suggestion needs analysis in further research.

Second, the results of this study of sitcoms and the acceptance of gendered sexual roles give some support for the proposed explanatory mechanism, but the findings do not provide conclusive answers. The results showed that sitcoms may trigger the three-step process of self-objectification, and that the component of internalization of the three-step process may increase acceptance of gendered sexual roles. However, in line with similar studies (e.g., Martino et al., 2005), we found that the proposed mechanism only marginally significantly mediated the relationship between television viewing and the acceptance of gendered sexual roles.

One explanation for the absence of unequivocal support for the proposed mechanism may lie in the focus on gendered sexual roles. This study tested the explanatory value of the three-step process only in its ability to explain the endorsement of gendered sexual roles as a result of exposure to sexual media. However, a review of research on the acceptance of gendered sexual roles has indicated that such roles are often influenced by "situational and interpersonal factors (e.g., the target's age, level of relationship commitment and number of partners)" that may lead scholars to erroneously conclude gendered sexual roles have not been endorsed (Crawford and Popp, 2003, p. 13).

Traditional views on gendered sexual roles have also been debated from a feministic perspective that has drawn attention to "new" gender stereotypes in which girls are expected to be "sexually empowered" (Gill, 2012). This literature highlights the ambiguity that is related to how one defines gendered sexual roles and the potential need for further research to redefine "gendered sexual roles " in the contemporary sexualized culture. A new means of addressing gender-stereotypical sexual roles for men and women may also offer valuable insights into the inconsistent results that have been reported with respect to the effects of

sexual media in relation to this subject (e.g., Ward and Friedman, 2006; Zurbriggen and Morgan, 2006).

However, this particular inconsistency was one of the reasons that we chose to study the acceptance of gendered sexual roles. Research on sexual television effects among adolescents has reported findings on a wide range of sexual attitudes, such as acceptance of sexual aggression toward women and endorsement of rape myths (Ward, 2003), recreational sexual attitudes (e.g., Ferris et al., 2007) and expectations and attributions concerning sexual and romantic relationships (e.g., Ward and Rivadeneyra, 1999). All of these sexual attitudes are theoretically (strongly) related to the process of self-objectification (Fredrickson and Roberts, 1997); thus, it may be valuable for future research to explore the role of this process in triggering these sexual media effects. This research may, however, take into account that internalization as an other-oriented component may more effectively explain relationships between media use and other-oriented sexual attitudes, such as endorsement of rape myths. Valuing appearance over competence and body surveillance are more self-oriented and may therefore explain more effectively relationships between media use and self-oriented sexual attitudes, such as expectations and attributions concerning one's own sexual and romantic relationships.

Apart from sexual attitudes, sexual media research has shown that media use may lead to the initiation of sexual intercourse and more advanced sexual experiences (e.g., Collins et al., 2004). Although these "personal" sexual behaviors are likely to be guided by a body-focused perspective (Sanchez et al., 2012), no research has thus far addressed these relationships; therefore, further research is warranted in this regard. Again, the more self-oriented components of valuing appearance over competence and body surveillance may explain more effectively relationships between media use and one's own sexual behavior than the other-oriented component of internalization.

Our study was strengthened by its longitudinal design but limited by the fact that 432 adolescents who participated in wave 1 did not participate in all waves. More importantly, those who dropped out of the study were more likely to score higher on the endorsement of gendered sexual roles. Therefore, this study may be underestimating the influence of the self-objectification process and sexualizing sitcoms on the acceptance of gendered sexual roles , and future research may be necessary to explore this influence in greater detail. Furthermore, although a longitudinal study design provides information about the temporal order of how television exposure relates to adolescents' sexuality and body image, experimental research is needed to support the causal order of these relationships. In addition, the current study is limited by its focus on sitcoms. Future research on this issue is therefore need to explore other media types, such as fashion magazines and music television, as these media types have been related to the three-step process of self-objectification (Vandenbosch & Eggermont, 2012) and acceptance of gendered sexual roles (Ward, 2003). Lastly, although the conclusions of this study shed new light on sexual media effect research, the findings may be limited to the country in which the study was conducted, i.e., Belgium. More precisely, the West-European context may have influenced our findings as a result of a different sexual culture. However, various scholars have emphasized similarities in media content (e.g., Vandenbosch et al., 2013) and outcomes related to body image and sexuality (e.g., Moradi & Huang, 2008; Vandenbosch & Eggermont, 2012) among Western adolescents. Therefore, the findings of this study may still have considerable relevance for research conducted in other Western and Northern European countries and in the U.S. Nevertheless, research is lacking on potential differences and similarities between Western and non-Western cultures regarding the influence of television on adolescents' sexuality and body image. Future research is therefore needed to explore whether our findings may also apply to other non-Western cultures.

In sum, this longitudinal study proposed and tested an integrative model of sexualizing television use, the three-step process of self-objectification and the sexual attitudes of adolescents. In this study, viewing sexualizing sitcoms positively predicted the three-step process of self-objectification, and the internalization of appearance ideals positively predicted acceptance of gendered sexual roles. This study calls for further research on the relationships among sexualizing media use, the three-step process of self-objectification and the developing sexuality of adolescents and, more generally, for the integration of research lines that investigate the effect of media on body-related outcomes and the effect of on sexual outcomes.

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6.1. Table 1

Means and Standard Deviations for the Studied Variables

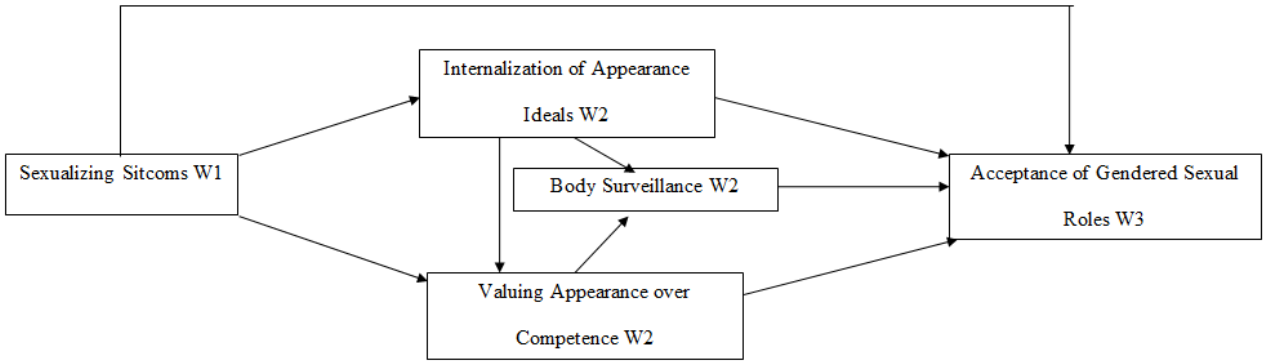
			Entire sample		Girls		Boys	
	Min	Max	*M*	*SD*	*M*	*SD*	*M*	*SD*
Sexualizing sitcoms W1	.51	2.53	1.08	.51	1.12	.54	1.05	.48
Internalization W1	1	5	2.51	.87	2.77	.87	2.30	.81
Internalization W2	1	5	2.56	.81	2.78	.82	2.38	.75
Valuing appearance over competence W1	-9	9	-.68	1.50	.04	1.44	-1.22	1.30
Valuing appearance over competence W2	-9	9	-.46	1.50	.36	1.40	-1.10	1.24
Body surveillance W1	1	5	3.09	.84	3.48	.76	2.79	.77
Body surveillance W2	1	5	3.13	.84	3.51	.74	2.84	.80
Gendered sexual roles W1	1	5	3.00	.47	2.86	.39	3.12	.49
Gendered sexual roles W2	1	5	3.01	.44	2.87	.37	3.12	.47
Gendered sexual roles W3	1	5	2.99	.46	2.85	.38	3.09	.49

6.2. Table 2

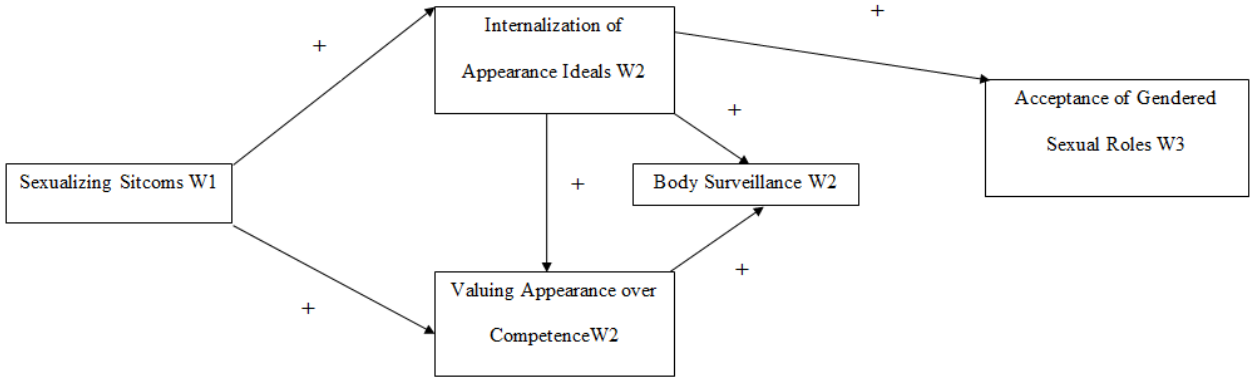
Zero-Order-Correlations for the Entire Sample, Girls and Boys

	S Sit W1	Int W1	Int W2	VA W1	VA W2	BS W1	BS W2	GSRW1	GSR W2	GSRW3
S Sit W1	1	All .10**	All . 10**	All .05	All .07*	All .07*	All .10**	All .02	All .02	All .01
		Boys .09*	Boys .09*	Boys -.05	Boys .03	Boys .02	Boys .03	Boys .04	Boys .04	Boys .04
		Girls .08	Girls .09	Girls . .10*	Girls . .07	Girls . .10*	Girls . .16**	Girls . .05	Girls .05	Girls . .03
Int W1		1	All .61***	All .37**	All .33***	All .56***	All .49***	All .15***	All .11**	All .11***
			Boys .52***	Boys .21***	Boys .16***	Boys .49***	Boys .41***	Boys .22***	Boys .15**	Boys .15**
			Girls . .65***	Girls . .38***	Girls . .31***	Girls .54***	Girls .46***	Girls .30***	Girls .26***	Girls .27***
Int W2			1	All .31***	All .34***	All .45***	All .53***	All .08*	All .17***	All .13***
				Boys .18***	Boys .22***	Boys .35***	Boys .45***	Boys .10*	Boys .21***	Boys .14**
				Girls .28***	Girls .29***	Girls .45***	Girls .54***	Girls .24***	Girls .31***	Girls .30***
VA W1				1	All .71***	All .50***	All .38***	All -.02	All -.05	All -.04
					Boys .58***	Boys .34***	Boys .21***	Boys .11*	Boys .06	Boys .07
					Girls .69***	Girls .45**	Girls .31***	Girls .12*	Girls .11*	Girls .09
VA W2					1	All .47***	All .45***	All -.03	All -.05	All -.05
						Boys .27***	Boys .26***	Boys .07	Boys .08	Boys .05
						Girls .41**	Girls .39***	Girls .21***	Girls .15**	Girls .13*
BS W1						1	All .71***	All .03	All -.00	All .01
							Boys .62***	Boys .10*	Boys .07	Boys .11**
							Girls .70***	Girls .28***	Girls .22***	Girls .17**
BS W2							1	All .02	All .05	All .04
								Boys .07	Boys .09*	Boys .10*
								Girls .25***	Girls .31***	Girls .27***
GSR W1								1	All .64***	All .53***
									Boys .60**	Boys .46***
									Girls .64***	Girls .57***
GSRW2									1	All .66***
										Boys .62***
										Girls .66***
GSRW3										1

Note. *$p < .05$; **$p < .01$; ***$p < .001$; S Sit = Sexualizing sitcoms, Int = Internalization of appearance ideals, VA = Valuing appearance over competence, BS = Body surveillance, GSR = Acceptance of gendered sexual roles



7.1. Figure 1. Hypothesized model for the relationships between the use of sexualizing sitcoms, internalization, valuing appearance over competence, body surveillance and acceptance of gendered sexual roles.



7.2. Figure 2. Structural equation model for the hypothesized relationships between the use of sexualizing sitcoms, internalization, valuing appearance over competence, body surveillance and acceptance of gendered sexual roles. Note: All paths are significant at $p < .05$. For clarity, error terms, covariances, control variables and measurements are not shown.